

CONTENTS

<i>Acknowledgments</i>	ix
<i>Introduction</i>	xi
1. Tree of Life in Ancient Human Culture and Art	1
Introduction	1
Tree of Life: Multiple Meanings	2
The Tree of Life: A Metaphor for Biodiversity and Connectivity	3
Ancient Views of the Tree of Life	5
From Trees to Ladders: Greeks and the Ladder of Life	14
References	17
Further Reading	19
2. History of the Modern Concept of the Tree of Life	21
Tree of Life—Darwin and Evolutionary Connections	21
Revolution: Explicit Methods for Constructing Trees of Evolutionary Relationships	28
Tree Building 101	31
Reading Phylogenetic Trees	34
References	37
Further Reading	38
3. Building the Tree of Life: A Biodiversity Moonshot	39
The Tree of Life: What Took so Long?	39
The Perfect Storm	40
The Tree of Life: Too Big to Nail	41
Graph Theory, Google, and Building the First Tree of Life	45
More Challenges: What's in a Name?	49
Tree of Life Versus Network of Life	51
Miles to Go Before We Sleep	53
References	55
4. How Many Living Species?	57
How Many Species Have Been Named?	57
We Are Living in a Bacterial World	63

Haves and Have Nots: Resources for Major Groups of Life	66
Challenges to Completing the Tree of Life	70
References	72
5. The Value of the Tree of Life	75
Medicines	77
Disease	83
Conservation	85
Response to Climate Change	96
Crop Improvement	99
Phylogenetic Detective: Forensics and the Tree of Life	102
Ecosystem Services	106
Moral Responsibility and Mental Healing	107
Developing Countries—The Most to Lose	109
Conclusion	110
References	112
6. Fate of the Tree of Life	117
Going, Going, Gone—Disappearing Species	117
Welcome to the Sixth Mass Extinction	119
Under Siege	121
No Ecosystem Left Behind—Intensified Threats to Oceanic Extinction	126
Causes of Extinction	126
Habitat Loss	128
Climate Change	129
"Déjà Vu All Over Again": One Family's Story of the Demise of Species	134
No Species Is an Island	140
Give Me Shelter—Protected Areas	143
References	145
Further Reading	150
7. Teaching the Tree	151
References	164
<i>Index</i>	167